trends in CELL BIOLOGY

Subject Index

Author Index

Books Reviewed

1993

Vol 3
Issues 1–12

ISSN 0962 8924

Trends in Cell Biology

Elsevier Trends Journals
68 Hills Road
Cambridge
UK CB2 1LA
Tel +44 (0) 223 315961
Fax +44 (0) 223 464430

Advisory Editorial Board

ADRIENNE CLARKE, Melbourne, Australia
SARA COURTNEIDGE, Heidelberg, Germany
SUSAN GASSER, Lausanne, Switzerland
ARI HELENIUS, New Haven, USA
KEN HOLMES, Heidelberg, Germany
TONY HUNTER, La Jolla, USA
JEREMY HYAMS, London, UK
RALPH ISBERG, Boston, USA
RON LASKEY, Cambridge, UK
DAVID MEYER, Los Angeles, USA
RICHARD PAGANO, Baltimore, USA
HUGH PELHAM, Cambridge, UK
HIDDE PLOEGH, Amsterdam, The Netherlands
JEFF WILLIAMS, London, UK
VIRGINIA ZAKIAN, Seattle, USA
LARRY ZIPURSKY, Los Angeles, USA

Editor Carol Featherstone
Assistant Editor Carolyn Elliss
Editorial Secretary Jannette Ferriday
Publisher Peter Desmond

Copyright © 1994 Elsevier Science Ltd

All rights reserved. No part of this publication may be translated, reproduced, stored in an electronic retrieval system, published or transmitted, in any form or by any means, such as, but not limited to, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the copyright owner and the publisher, Elsevier Trends Journals, 68 Hills Road, Cambridge, UK CB2 1LA.

Author Index

BR – Book Review
L – Letter
MR– Meeting Report
T – Technique

A

Aitken, A., *The Annexins* (BR) 138
Altschuler, Y., *see* Galili, G.
Amos, W. B., *Light Microscopy* (BR) 28
Anderson, R. G. W., Potocytosis of small molecules and ions by caveolae 69
Anderson, R. G. W., Dissecting clathrin-coated pits 177
Asai, D. J. and Brokaw, C. J., Dynein heavy chain isoforms and axonemal motility 398

B

Baltimore, D., *see* Mayer, B. J.
Bansal, R., *see* Pfeiffer, S. E.
Barkalow, K., *see* Satir, P.
Bartles, J. R., *Cell Biology Labfax* (BR) 173
Bloch, R. J., *see* Pumplin, D. W.
Bornens, M., *see* Mignot, J. P.
Bowers, C. W. and Dahm, L. M., Buffers for Cell Culture (L) 75
Bradbury, S., *Electronic Light Microscopy* (BR) 451
Bray, D., Towards the molecular physiology of cell movements 363
Brokaw, C. J., *see* Asai, D. J.
Bronner-Fraser, M., Neural crest cell migration in the developing embryo 392
Brooksbank, C., *Postgraduate Study in the Biological Sciences: A Researcher's Companion* (BR) 362
Brooksbank, R. A., *Genetic Engineering* (BR) 282
Brown, A. J. P., mRNA translation and turnover: a cellular perspective on their relationship 180
Brugerolle, G., *see* Mignot, J. P.
Bryant, P. J., Towards the cellular functions of tumour suppressors 31

C

Carpita, N. C., *see* Wyatt, S. E.
Cho, K. R., *see* Hedrick, L.
Condeelis, J., Understanding the cortex of crawling cells: insights from *Dictyostelium* 371
Copp, A. J., *Genes in Mammalian Reproduction* (BR) 284
Corrie, A. R., *DNA–Protein Interactions* (BR) 322
Cress, A., *Intracellular Protein Degradation: in focus* (BR) 175

D

D'Alessio, G., New and cryptic biological messages from RNases 106
Dahm, L. M., *see* Bowers, C. W.
Daneholt, B., *see* Mehlin, H.
Deamer, D. W., *Beginnings of Cellular Life: Metabolism recapitulates Biogenesis*[1] (BR) 319
Dedhar, S., *Receptors for Extracellular Matrix* (BR) 66
De Matteis, M. A., *see* Luini, A.
DePamphilis, M. L., How transcription factors regulate origins of DNA replication in eukaryotic cells 161
Didier, P., *see* Mignot, J. P.
Draetta, G., cdc2 activation: the interplay of cyclin binding and Thr161 phosphorylation 287
Dreyfuss, G., *see* Piñol-Roma, S.
Dubochet, J., Twisting in a crowd 1

E

Emans, N., *see* Gruenberg, J.

F

Faissner, A., *Protocols for Neural Cell Culture* (BR) 171
Foord, O., *see* Rotter, V.
Franklin, F. C. H., *see* Franklin-Tong, V. E.
Franklin-Tong, V. E. and Franklin, F. C. H., Gametophytic self-incompatibility: contrasting mechanisms for *Nicotiana* and *Papaver* 340
Funnell, B. E., Participation of the bacterial membrane in DNA replication and chromosome partition[2] 20
Futter, C. and Marsh, M., Endocytosis and pasta (MR) 316

G

Gadhavi, P. L., *Transcription Factors: A Practical Approach* (BR) 452
Galili, G., Altschuler, Y. and Levanony, H., Assembly and transport of seed storage proteins 437
Gasser, S. M., *see* Gilson, E.
Gerdes, H-H., *see* Seethaler, G.
Geuze, H. J., *see* Slot, J. W.
Gilman, A. G., *see* Iniguez-Lluhi, J.
Gilson, E., Laroche, T. and Gasser, S. M., Telomeres and the functional architecture of the nucleus 128
Glass, D. J. and Yancopoulos, G. D., The neurotrophins and their receptors 262
Goddard, H., *DNA is Here to Stay* (BR) 246
Goessens, G., *see* Scheer, U.
Goldberg, M. W., *see* Allen, T. D.
Gray, J., *Plant Organelles. Compartmentation of Metabolism in Photosynthetic Cells* (BR) 247
Gruenberg, J. and Emans, N., Annexins in membrane traffic 224

H

Hagelberg, E., *Molecular Applications in Biological Anthropology* (BR) 319
Hall, A., *see* Rey, I.
Hamasaki, T., *see* Satir, P.
Hansen, S. H., *see* van Deurs, B.
Harlow, E., *see* Helin, K.
Hartmann, E., *see* Kutay, U.
Hedrick, L., Cho, K. R. and Vogelstein, B., Cell adhesion molecules as tumour suppressors 36
Helin, K. and Harlow, E., The retinoblastoma protein as a transcriptional repressor 43
Hermanowski-Vosatka, A., *Cell–Cell Interactions: A Practical Approach* (BR) 281
Hickey, I., *Animal Cell Culture* (BR) 453
High, S. and Stirling, C. J., Protein translocation across membranes: common themes in divergent organisms 335
Holm, P. K., *see* van Deurs, P.
Holmes, K. C., Sander, C. and Valencia, A., A new ATP-binding fold in actin, hexokinase and HSC70 53
Höner, B., *see* Schliwa, M.
Hooper, M., *Cell Culture Labfax* (BR) 172
Howell, K. E., *see* Stanley, K. K.

I

Iniguez-Lluhi, J., Kleuss, C. and Gilman, A. G., The importance of G-protein βγ subunits 230
Ishihara, A., *see* Lee, J.

J

Jacobson, K., *see* Lee, J.
Johnson, K. A. and Rosenbaum, J. L., Flagellar regeneration in *Chlamydomonas*: a model system for studying organelle assembly 156

K
Kalt, A. and Shliwa, M., Molecular components of the centrosome 118
Kleuss, C., *see* Iniguez-Lluhi, J.
Kouzarides, T., Transcriptional regulation by the retinoblastoma protein 211
Krämer, H., Patrilocal cell–cell interactions: sevenless captures its bride 103
Kuchler, K., Unusual routes of protein secretion: the easy way out 421
Kutay, U., Hartmann, E. and Rapoport, T. A., A class of membrane proteins with a C-terminal anchor 72

L
La Thangue, N. B. and Taylor, W. R., A structural similarity between mammalian and yeast transcription factors for cell-cycle-regulated genes (L) 75
Lamond, A. I. and Goldberg, M. W., High-resolution SEM in cell biology 205
Laroche, T., *see* Gilson, E.
Lawrence, J. B., *see* Xing, Y.
Lazarow, P. B., Genetic approaches to studying peroxisome biogenesis 89
Lee, J., Ishihara, A. and Jacobson, K., How do cells move along surfaces? 366
Levanony, H., *see* Galili, G.
Lill, R., *see* Stuart, R. A.
Lin, H. Y. and Lodish, H. F., Receptors for the TGF-β superfamily: multiple polypeptides and serine/threonine kinases 14
Lindmo, T., *Flow Cytometry: First Principles* (BR) 320
Lindmo, T., *Flow Cytometry Data Analysis: Basic Concepts and Statistics* (BR) 321
Lippincott-Schwartz, J., Bidirectional membrane traffic between the endoplasmic reticulum and Golgi apparatus 81
Lodish, H. F., *see* Lin, H. Y.
Lucas, W. J. and Wolf, S., Plasmodesmata: the intercellular organelles of green plants 308
Lucocq, J., Unbiased 3-D quantitation of ultrastructure in cell biology (T) 354
Luini, A. and De Matteis, M. A., Receptor-mediated regulation of constitutive secretion 290

M
Machesky, L. M. and Pollard, T. D., Profilin as a potential mediator of membrane–cytoskeleton communication[1] 381
Mahadevan, L. C., *Growth Factors: A Practical Approach* (BR) 450
Marsh, M., *see* Futter, C.
Martin, S. J., Apoptosis: suicide, execution or murder? 141
Maxfield, F. R., Regulation of leukocyte locomotion by Ca^{2+} 386
Mayer, B. J. and Baltimore, D., Signalling through SH2 and SH3 domains 8
McNeil, P. L., Cellular and molecular adaptations to injurious mechanical stress 302
Mehlin, H. and Daneholt, B., The Balbiani ring particle: a model for the assembly and export of RNPs from the nucleus? 443
Mignot, J. P., Brugerolle, G., Didier, P. and Bornens, M., Basal-body-associated macromolecules: a continuing debate 220
Miller, R. G., *Molecular Mechanisms of Immunological Self-Recognition* (BR) 448
Miyazaki, S., *Inositol Phosphates and Ca^{2+} Signalling* (BR) 28
Morrison, T. G., *Viral Fusion Mechanisms* (BR) 359

N
Navot, N., *see* Rotter, V.
Newman, C. M., *Lipid Modification of Proteins: A Practical Approach* (BR) 139
Nielsen, O., Signal transduction during mating and meiosis in *S. pombe* 60
Nigg, E. A., Cellular substrates of $p34^{cdc2}$ and its companion cyclin-dependent kinases 296

O
O'Sullivan, A. J., Good ideas waiting to fuse (MR) 26
Ouzounis, C. A., *The Machinery of Life* (BR) 359

P
Pai, E. F., *Protein Structure – New Approaches to Disease and Therapy* (BR) 450
Paine, P. L., Nuclear protein accumulation by facilitated transport and intranuclear binding 325
Parsons, J. T., *see* Schaller, M. D.
Pavlovic, J., *see* Staeheli, P.
Payne, G. S., *see* Wisbach, K.
Perry, S. V., *Muscle Contraction* (BR) 281
Peterson, M. G., *A Genetic Switch* (BR) 101
Pfeiffer, S. E., Warrington, A. E. and Bansal, R., The oligodendrocyte and its many cellular processes 191
Picard, D., Steroid-binding domains for regulating the functions of heterologous proteins *in cis* (T) 278
Piñol-Roma, S. and Dreyfuss, G., hhRNP proteins: localization and transport between the nucleus and the cytoplasm 151
Pitossi, F., *see* Staeheli, P.
Pollard, T. D., *see* Machesky, L. M.
Possee, R. D., *Baculovirus Expression Vectors: A Laboratory Manual* (BR) 174
Pumplin, D. W. and Bloch, R. J., The membrane skeleton[3] 113

Q
Quinn, P., *Preparative Centrifugation: A Practical Approach* (BR) 285

R
Rapoport, T. A., *see* Kutay, U.
Rey, I. and Hall, A., Tumour suppressors and the regulation of GTP-binding protein activity 39
Riezman, H., Yeast endocytosis 273
Riezman, H., Three clathrin-dependent budding steps and cell polarity 330
RoccaSerra, J., *Scanning Electron Microscopy and X-Ray Microanalysis* (BR) 67
Rosenbaum, J. L., *see* Johnston, K. A.
Rotter, V., Foord, O. and Navot, N., In search of the functions of normal p53 protein 46
Rowe, A., *Microcomputers in Biochemistry: A Practical Approach* (BR) 27

S
Sakai, L. Y., *Connective Tissue and Its Heritable Disorders: Molecular, Genetic and Medical Aspects* (BR) 361
Sander, C., *see* Holmes, K. C.
Sandvig, K., *see* van Deurs, B.
Satir, P., Barkalow, K. and Hamasaki, T., The control of ciliary beat frequency 409
Saunders, W. S., Mitotic spindle pole separation 432
Schaller, M. D. and Parsons, J. T., Focal adhesion kinase: an integrin-linked protein tyrosine kinase 258
Scheer, U., Thiry, M. and Goessens, G., Structure, function and assembly of the nucleolus 236
Schliwa, M. and Höner, B., Microtubules, centrosomes and intermediate filaments in directed cell movement 377
Schliwa, M., *see* Kalt, A.
Schmid, S. L., Coated-vesicle

formation *in vitro*: conflicting results using different assays 145
Schneider, R., *Receptor Subunits and Complexes* (BR) 138
Scott, S. V., *see* Theg, S. M.
Seethaler, G. and Gerdes, H-H., The ins and outs of the secretory pathway (MR) 168
Slack, J., *The Early Development of Xenopus laevis* (BR) 209
Slot, J. W. and Geuze, H. J., The immunofluorescent era of membrane traffic 214
Staeheli, P., Pitossi, F. and Pavlovic, J., Mx proteins: GTPases with antiviral activity 268
Stanley, K. K. and Howell, K. E., TGN38/41: a molecule on the move 252
Stelzer, E. H. K., *Optical Microscopy* (BR) 319
Stirling, C. J., *see* High, S.
Streuli, C., *Epithelial Organization and Development* (BR) 173
Stuart, R., Lill, R. and Neupert, W., Sorting out mitochondrial proteins (MR) 135

T

Tafuri, S. R. and Wolffe, A. P., Dual roles for transcription and translation factors in the RNA storage particles of *Xenopus oocytes* 94
Taylor, W. R., *see* La Thangue, N. B.
Theg, S. M. and Scott, S. V., Protein import into chloroplasts 186
Thiry, M., *see* Scheer, U.
Tsien, R. Y., Bacskai, B. J. and Adams, S. R., FRET for studying intracellular signalling (T) 242

V

Valencia, A., *see* Holmes, K.C.
van Deurs, B., Holm, P. K., Sandvig, K. and Hansen, S. H., Are caveolae involved in clathrin-independent endocytosis? 249
Vaughan, T. J., *PCR Protocols* (BR) 449
Vogelstein, V., *see* Hedrick, L.

W

Wakelam, M. J. O., *Protein kinase C: Current Concepts and Future Perspectives* (BR) 448
Warrington, A. E., *see* Pfeiffer, S. E.
Watts, A., *Structural and Dynamic Properties of Lipids and Membranes* (BR) 283
Weidman, P., *Reconstitution of Intracellular Transport* (BR) 360
White, J. M., Merging minds on membrane merger (MR) 99
Wisbach, K. and Payne, G. S., Dynamic retention of TGN membrane proteins in *Saccharomyces cerevisiae* 426
Witman, G. B., *Chlamydomonas* phototaxis 403
Wolf, S., *see* Lucas, W. J.
Wyatt, S. E. and Carpita, N. C., The plant cytoskeleton–cell-wall continuum[4] 413

X

Xing, Y. and Lawrence, J. B., Nuclear RNA tracks: structural basis for transcription and splicing? 346

Y

Yancopoulos, G. D., *see* Glass, D. J.

[1] correction: see *TCB* 4, 33 (1994)
[2] correction: see page 88
[3] correction: see page 323
[4] correction: see *TCB* 4, 71 (1994)

Subject Index

A
ABC-transporters 421–425
ABF1 transcription factor 166
ABP-120 protein 373–374
ABP-280 374
Acanthamoeba profilin 381, 384
acetylcholine receptor (AChR)
  clusters, membrane skeleton and 114–115, 117
ACT1 gene 274
actin
  annexins and 226, 416
  cell motility and 366–369, 386–387
    calcium regulation 367, 368–369, 386–391
    capping proteins 372, 375, 384, 387
    in *Dictyostelium* 366, 367, 371–376
    profilin binding 368, 369, 372, 373, 381–385, 387
    sequestering proteins 372–373
  cell wounding and 304
  evolution of 58–59
  at focal adhesions 258, 413–414
  growth factors and 383–384
  intraflagellar transport and 160
  in *Listeria* comet tail formation, rho and 228
  membrane skeleton and 113–114, 115, 116
  in oligodendrocytes 196
  nucleotide binding by 383
  in plant cytoskeleton–cell-wall continuum 413–417
  structural similarities to hexokinase and Hsc70 53–59
  yeast endocytosis and 274–275, 330, 331–332
actin-binding proteins 116, 298, 368, 369, 371–372, 373–375, 382, 387 *see also individual proteins*
α-actinin 113, 258, 373
activin receptors 17–18, 19
acyl-CoA oxidase, peroxisomal 89
adaptor complexes 52, 145, 146, 147, 177–179, 316, 331
adducin 113
adenosine, transport of 70
adenovirus
  DNA replication 162, 163–164, 165, 166
  transcription 352
adenylation control element-binding protein 97
adenylate cyclase(s)
  G protein subunits and 230–231, 232, 233, 235
  isoforms of 232
ADP-ribosylation factor (ARF)
  brefeldin A and 51, 85–86, 168
  coated-vesicle formation and 147–148
  nuclear envelope reconstitution and 334
a-factor, secretion of 422–423, 424
agglutinins 158
aginactin 372
air8 gene 31, 32–33
alcohol oxidase 92
alkaline phosphatase (ALP): DPAP-A–ALP fusion protein 427, 429
α-factor
  endocytosis 273–276, 331, 334
  prepro-α-factor translocation 335–336, 338, 427, 428–430
aminopeptidase I (API), vacuolar targeting of 7
angiogenesis
  RNases and 106, 108, 109
  TGF-β and 15
angiogenin 106, 108, 109
ankyrin 113–114, 115, 116–117
annexins 224–226, 416
  coated-vesicle formation and 147, 178, 179, 224
  membrane fusion and 99, 179, 226
antispermatogenic factor 107, 108
antitumour RNases 106, 107, 108, 109
AP-1 protein 165, 166
AP-2 complexes 52, 145, 146, 147, 177–179
AP-3 protein 331
APC gene 31
apolipoprotein E, constitutive secretion of 291
apoptosis 141–144
  p53 protein and 34, 47
  RNases and 108
arteries, mechanical stress and 303, 305
arylsulphatase gene, *Chlamydomonas* 157
ATF-2 protein 211, 212–213
atherosclerosis, cell wounding and 303
ATP
  ATP–actin 383
  chloroplast protein transport and 187, 188, 189
  dynein and 398, 399, 400, 401, 410, 411
  exocytosis and 26
  in vitro coated-vesicle formation and 145, 146, 147, 178, 179
  mitochondrial 136
  nuclear protein accumulation and 325, 328
  SEC proteins and 336
ATPase: Na^+–K^+-ATPase and membrane skeleton 116–117
ATP-binding domain in actin, hexokinase and Hsc70 53–59
autophagy in yeast 5
auxilin 331
awd gene 41
axoneme
  assembly 156, 157–158, 159, 160
  Chlamydomonas phototaxis 406–408
  ciliary beat control 409–412
  dynein heavy chain isoforms 398–402
  sliding and bending in 398–399, 409–410

B
B′ protein 22
B23/NO38 protein 239
Balbiani ring RNP particle 443–446
Band 1 protein 337
band 4.1 protein 113
basal-body-associated macromolecules 220–223
basic fibroblast growth factor (bFGF)
  oligodendrocytes and 193, 194, 196
  release from wounded cells of 304–306
  secretion of 423
  TGF-β receptor and 16
Bcr protein, SH3 domain and 11–12
BEM gene products, SH3 domains and 11, 12
BET1 protein 73
β-adrenergic receptor kinase (βARK) family, G-protein subunits and 232, 233
betaglycan 334
bimC protein 126, 433, 435
BiP protein 338
  seed storage proteins and 438, 442
bombesin 261
BOS1 protein 73, 256
boss protein: sev–boss interactions in R7 neuron development 103–105
brain-derived neurotrophic factor 262
brefeldin A
  adaptor binding and 316
  bidirectional traffic and 84, 85–86, 87, 168
  Golgi tubulation and 110
  mode of action of 51
  yeast mutants sensitive to 185
BSP49 gene 78
BS-RNase 107, 108

BSST 146
Bt1 protein 4, 188–189
buffers for cell culture 76–77
butyrlcholinesterase 394
byr1 gene 65, 333

C

C3 toxin: effects of chimeric toxin DC3B 228
cactus gene product 150
cadherin(s)
membrane skeleton and 116–117
neural crest cell migration and 392, 394
tumourigenesis and 36, 37–38
calcineurin 390, 391
calcium (Ca^{2+})
annexins and 147, 178, 224, 225, 226
Ca^{2+}-dependent activator protein for secretion 26
Ca^{2+} pump 250
caveolae and 250
cell motility and 367, 368–369, 386–391, 406–408
ciliary beat frequency 409, 411, 412
centrin and 80, 124, 157, 408
centrosomal proteins and 124–125
Chlamydomonas phototaxis and 403, 405–408
coated-vesicle formation and 145, 147, 178
constitutive secretion and 291
deflagellation and 157
focal adhesion kinase and 259
G proteins and 111, 334
nuclear envelope assembly reconstitution and 334
self-incompatibility in plants and 340, 343
signalling by potocytosis 71
caldesmon 298
calmodulin 387, 391, 407–408
calpactin 99
caltractin 124
CAP protein 384
CAPS protein 26
catalase 90, 91, 92
caveolae
clathrin-independent endocytosis and 229, 249–251, 316
potocytosis by 69–71, 250
caveolin 69, 249, 316
mammalian homologue *see* VIP21
CBF2 gene and chromosome segregation 257
CBF3 complex 257
CD4, endocytosis of 317
cdc2 gene
E2F-binding sites in 44
product of *see* $p34^{cdc2}$ protein; cyclin-dependent kinase(s)
cdc2-activating kinase (cak) 287–288
cdc10 protein 75–76
CDC28–cyclin complex
autoregulation and 419
FAR1 protein and 256, 299
see also cyclin-dependent kinases; cyclins
cell adhesion/cell adhesion molecules
cell motility and 367–368, 387, 389–390, 391, 392
focal adhesions 258–261, 413–414
membrane skeleton and 116–117
plant cytoskeleton–cell-wall continuum 413–416
tumour suppressors and 32, 36–39
see also integrins
cell culture, buffers for 76–77
cell death *see* apoptosis
cell motility 363–412
calcium and 367, 368–369, 386–391
centrosome and 377, 378–379
Chlamydomonas phototaxis 403–408
ciliary beat frequency 409–412
Dictyostelium 366, 367, 371–376, 378
dynein heavy chain isoforms and axonemal motility 398–402
microtubules/intermediate filaments in 377–379, 398–402
neural crest cell migration 392–396
neutrophil 367, 377, 386–391
profilins and 368, 369, 372, 373, 381–385, 387
cell wall, plant
cytoskeleton–cell-wall continuum 413–417
plasmodesmata 308–314
cellubrevin 295
CENP-E protein 5, 435
centrin 124, 157, 408
mutational analysis of 80
centriole
basal-body-associated macromolecules 220–223
centriole-associated protein in *Chlamydomonas* 80
centromere
CBF2/NDC10 gene and 257
telomere and 132–133
centrophilin 125
centrosome(s) 118
cell motility and 377, 378–379
molecular components of 118–126, 220–223
$p34^{cdc2}$ and 126, 298
c-*fos* nuclear RNA 347, 350, 351, 352
CHC1 gene 274, 275, 334, 428, 429, 430–431
N-chimerin 11–12
Chironomus tentans Balbiani ring RNP particle 443–446
Chlamydomonas
centriole-associated proteins 80
dynein heavy chain isoforms 399–400, 401–402
eyespot 403
flagellar regeneration 156–160
phototaxis 403–408
transformation tagging 419
chloroplast(s)
contact-site translocation intermediate in 111, 187–188
protein targeting in 4, 52, 186–190
CHO1 antigen (MKLP-1 protein) 5, 435, 436
cholesterol
Golgi complex and 418
mechanical stress and 304
chondroitin sulphate proteoglycans (CSPGs) 394, 396
chromatin
apoptosis and 141
DNA replication origin activity and 165–166
hnRNP proteins and 151
licensing factor and 420
liquid crystal structure 2–3
nuclear–mitotic-apparatus protein and 125
nucleolus and 237, 238
nucleosome reorganization without DNA replication 78
telomeres and 128–133
transcriptionally active, localization of 346
chromogranin B 169
chromosome(s)
bacterial membrane and partition of 20, 22–24
CBF2/NDC10-mediated segregation of 257
nucleolus-organizing regions 239, 240
polytene 351–352, 443–446
spindle pole separation 432–436
synaptonemal complex protein ZIP1 149
telomeres 128–133
topoisomerase II mutants and 294
ciliary beat frequency, control of 409–412
CIN8 protein (Cin8p) 433–434, 435, 436
c-Jun transcription factor domain 163, 165, 166

clathrin
coated-vesicle formation 145–148, 177–179, 316
endocytosis in yeast and 74, 275, 330–332, 428
heavy chain gene (*CHC1*) 274, 275, 334, 428, 429, 430–431
TGN membrane protein retention and 428, 429–431
three clathrin-dependent budding steps 330–332
cloacin DF13 106–107, 109
c-Myc protein, pRB and 211, 212
coated-vesicle formation 316
annexins and 147, 178, 179, 224
AP-2-induced aggregation of membrane vesicles 52
constitutive secretion and 291
in vitro systems 145–148, 177–179, 316, 420
TGN38/41 protein and 252–255, 331
three clathrin-dependent budding steps 330–332
coatomer 82, 85–87, 420
Golgi tubulation and 110
yeast 79
see also COP proteins
coiled body 198–203, 347
colicins 106–107, 109
export of 421
collagen synthesis, TGF-β and 14, 18
collagenase, TGF-β and 14–15
connexins 416
constitutive secretion 290–292, 295, 316
COP proteins 168
β-COP 26–27, 82, 86, 110, 168, 420
β′-COP 168, 293
γ-COP 168
cornea, bFGF release following injury to 305
COX12 gene 50
crk gene product, SH2/SH3 domains of 12, 184
cryoelectron microscopy 1, 294
CSPα 125
c-Src protein, SH2 domain of 10
cut7 protein 126, 433, 436
cyclic AMP (cAMP)
actin and 371, 372, 373, 375
ciliary beat frequency and 409, 411–412
yeast sexual differentiation and 61
cyclic-AMP-dependent protein kinase
activation of 287, 288, 289
ciliary beat frequency and 409, 411–412
fluorescence resonance energy transfer study of 242–245
cyclic GMP phosphodiesterase, G protein subunits and 233, 235
2′-3′-cyclic nucleotide 3′-phosphohydrolase (CNP) 191, 195, 196
cyclin(s) 296
autoregulation in yeast of 419
cdc2/cdk protein activation and binding of 287–289, 296–300, 419
centrosomal proteins and 126
FAR1 protein and 256, 299
transcriptional control and 44
uracil-DNA glycosylase encoded by cyclin-like gene 112
cyclin-dependent kinase(s)
autoregulation in yeast and 419
cellular substrates of 296–300
pRB and 43, 299–300
see also p34^{cdc2}; CDC28 protein
cyclolysin, export of 421
cytochrome b_2, mitochondrial 136–137
cytochrome b_5, ER-form of 72–73, 74
cytochrome c_1, mitochondrial 136–137
cytochrome oxidase assembly 50, 136, 137
cytokine receptors
TGF-β and 15, 16
cytomegalovirus, nuclear transcripts from 347
cytotoxicity
apoptosis and cytotoxic T lymphocytes 142, 143
of RNases 107, 108

D

Daf-1 protein 17
Dam methyltransferase 21–22
DC3B chimeric toxin, effects on rho control of cytoskeleton assembly of 228
DCC gene 31, 38
Delta transcript 347
DHFR gene, E2F-binding sites in 44
diacylglycerol
and cell motility 371–372
in Golgi complex 291
in yeast 185
Dictyostelium
motility of 366, 367, 371–376, 378
profilins of 372, 373, 381, 385
dihydrofolate reductase mRNA 182
dihydroxyacetone phosphate acyltransferase 90, 91
6–dimethyl aminopurine 420
dipeptidyl aminopeptidase (DPAP) 4, 427–429
diphtheria toxin: effects of chimeric toxin DC3B 228
dlg gene 31, 41
DM20 protein 191, 192, 195–196
DNA
apoptosis and 141
DNA-unwinding element (DUE) 162, 164–165
G strand 128, 129, 131–132
methylation 21–22
muscle transfection *in vivo* 306
nuclear concentration 1
nucleolar, detection of 237–238
origin-recognition element (ORE) 162, 164–165, 166
pRB binding to 212
repair *see* DNA repair
replication *see* DNA replication
RNP storage particle proteins and 94–95, 96, 97–98
rotation during transcription 1–3
telomeric 128–133
three-dimensional shape 1–3
topological domains 2
DNA gyrase 24
DNA repair
p53 protein and 48
transcription-repair coupling 229
uracil-DNA glycosylase encoded by cyclin-like gene 112
DNA replication
assembly of pre-replication centres immediately following mitosis 50
bacterial membrane and 20–22
cyclin-dependent kinases and 300
licensing factor for 420
nucleosome reorganization in absence of 78
origins of 50, 161–163, 333
p53 protein and 47
transcription factors and origin activation in 161–166, 333
DNA topoisomerase *see* topoisomerase
DnaA protein 20–21, 22
DnaB protein 22
dorsal gene product 150
DP-1 protein 75–76, 212
DPAP (dipeptidyl aminopeptidase) A/B 4
Drosophila
coated-vesicle formation 148
formins 150
hnRNP proteins 151
polytene nuclei 351–352
profilins 381, 385
R7 neuron development 103–105, 228
shibire gene 104, 148, 271, 294

telomeres 128, 131, 132
Toll–dorsal pathway 150
tumour suppressor genes 31, 32–33, 34, 37–38, 41
DSC1/MBF transcription factor 75
Duchenne muscular dystrophy 115, 303–304
dynamin
Drosophila homologue of 104, 148, 271
endocytosis and 271, 294, 316
Mx proteins and 271, 272
dynein
centrosomal 126
ciliary beat frequency 409–412
flagellar regeneration in *Chlamydomonas* 156, 157,158, 160
Golgi complex localization and 7
heavy chain isoforms and axonemal motility 398–402
dystrophin 113, 115, 303–304
dystrophin-related protein 113

E

E1 protein 164
E1A protein 211, 212
E2 protein 164, 166
E2F transcription factor
binding site 75–76
E2F-1 gene 45
pRB and 44–45, 75, 211, 212, 213
EBNA-1 protein 164
E-cadherin 37
ECP (eosinophil cationic protein) 107, 108, 109
EDN (eosinophil-derived neurotoxin) 107
Eg5 protein 126, 433, 434, 436
electron microscopy (EM)
cryoelectron microscopy 1, 294
high-resolution scanning EM 205–208
of nuclear envelope 79
immunofluorescence microscopy and 214–219
elongation factor (EF)
microtubule nucleation and EF1 126
PVN1 homology to EF1 416
α-sarcin and binding of 106
Xenopus RNP storage particle homologue of EF1 95–96, 98
end mutants, yeast 110, 275
endocytosis 316–318
annexins and 147, 178, 179, 224–225
caveolae and 229, 249–251, 316
coated-vesicle formation 52, 145–148, 177–179, 316, 330–332
constitutive 290, 291, 295, 316
dynamin and 271, 294, 316
potocytosis 69–71, 250
TGN protein retention and 428
three clathrin-dependent budding steps 330–332
yeast 110, 273–276, 330–332
endoglin 16
endoplasmic reticulum (ER)
antigen transporter of 424
bidirectional membrane traffic between ER and Golgi apparatus 81–87, 168
constitutive secretion 290–292
β-COP in budding 420
intermediate compartment and 82–84, 85, 86, 87, 168, 216
membrane proteins
C-terminal anchor 72–73, 74
insertion of 72–73, 74
KKXX retrieval system 229
lamin B receptor and 149
membrane traffic default pathway in yeast 4
plasmodesmata and 308, 309, 310
protein translocation across membranes: common themes in divergent organisms 335–339
rab proteins and 52, 81, 82
redox state of 6
ribosome receptors at 338
SEC2 and 79
SEC61 and 50
SED5 and 51
seed storage proteins in 437–442
TGF-β receptors and 18–19
transitional elements 81
translocation environment 293, 339
endosome(s) 317
ABC-transporters in 424
AP-2-induced aggregation of membrane vesicles and 52
fusion 99, 100
see also endocytosis
endothelin 261
eosinophil motility 368, 388
epidermal growth factor (EGF) receptor
annexin I and 224–225
SH2/SH3 domains and 8, 12–13
substrate choice 266
epithelial cell
basolateral membrane, membrane skeleton of 116–117
motility 378
Epstein–Barr virus
DNA replication 162, 163, 164, 166
nuclear RNA tracks 347, 348, 351
ERCC-3 helicase as 89 kDa subunit of TFIIH 229
ERD2 protein 87
ergosterol 185
erythrocyte membrane skeleton 113–114, 117, 303
EXO1 and EXO2 proteins 26
exocytosis 26–27
annexins and 99, 224
constitutive 290–292
membrane fusion and 99, 100
flickering fusion 256
synaptotagmin and 110
extracellular matrix (ECM)
bFGF in 305
cell adhesion molecules and 37, 38, 258
cytoskeleton–cell-wall continuum in plants 413–417
mechanical stress and 303, 304, 305
membrane skeleton and 115
neural crest cell migration and 392, 394, 395–396
terminology of 413
TGF-β and 14–15, 18

F

FAK protein (pp125^{FAK}) 258–261
FAR1 protein 256, 299
fat gene 31, 37–38
F_oATPase subunit 8 137
fatty acid oxidation, peroxisomal 89, 92
ferrodoxin 52, 188
Ffh protein: in bacterial signal-recognition particle 6
fibrillarin 199–200, 237, 239, 240
fibrinogen, focal adhesion kinase and 259
fibroblast(s)
motility of 366, 367, 369, 377, 378
peroxisomes of 90, 91
Trks in 264, 265, 266
fibroblast growth factor *see* basic fibroblast growth factor
fibronectin
integrins and 37
neural crest cell migration and 395, 396
neutrophil motility on 389, 390, 391
nuclear RNA 347, 348–349, 350, 351, 352
filamin 373–374, 375
fimbrin 373
flagella
basal-body-associated macromolecules 220–223
centrin, mutational analysis of 80
dynein heavy chain isoforms 399–400
intraflagellar transport 159–160

phototaxis in *Chlamydomonas* 403–408
regeneration in *Chlamydomonas* of 156–160
sea urchin flagellar microtubules, stabilization by histone H1 51
transformation tagging in *Chlamydomonas* 419
flickering fusion 256
fluorescence resonance energy transfer (FRET) 242–245
FLVRES motif 11
focal adhesion(s)
cell motility and 367–368
plant cytoskeleton–cell-wall continuum 413–414
focal adhesion kinase (FAK) 258–261
fodrin 113, 116–117, 387
formins 150
fragmin 373
FRGY2 protein 97, 98
FRNK (FAK-related-nonkinase) 258, 260
fructose-1,6-bisphosphatase degradation in yeast 5
FtsA protein 58
FtsY protein 6
FtsZ protein, GTP binding by 4
fungus/fungal
centrosome 123, 124
RNases 106, 108, 109
furin 169–170
FUS3 gene/product 64, 65, 256
fusion pores 100
flickering fusion and 256
fusion proteins 99–100, 101
see also individual proteins

G

G proteins *see also* GTP-binding proteins
α subunits of 111, 230–231, 232, 233, 235
β subunits of 111, 230–235
cell motility and 371, 375
Chlamydomonas photoreception and 405, 406
coated-vesicle formation and 147–148
coatomer binding and 86–87
ER–Golgi transport and 83, 86–87
exocytosis and 26–27
γ subunits of 111, 230–235
inositol trisphosphate and 334
membrane trafficking and 168–169
vesicular stomatitis virus 83
yeast pheromone signalling and 63–64, 231–232, 256, 273–274
see also individual proteins
$G_{\alpha 2}$ protein 371
$G_{\alpha i3}$ protein 86
G_e protein 26
GAL4 166
GAL4–ATF 211, 212–213
GAL4–SP1 213
GAL4–VP16 165, 333
galactosyltransferase 396
gametophytic self-incompatibility 106, 108, 340–344
gap junctions 308
GAP (GTPase-activating) proteins 39, 235
see also RasGAP
GAP-43 196
GDP-dissociation inhibitor, rab proteins and 318
gelsolin family 368, 372, 373, 384, 387
β-globin mRNA 181, 182
globulins 437
GLUT-4 317
glutathione, redox state of endoplasmic reticulum and 6
glycine-rich proteins (GRPs) 416
glycogen: in basal body lumen 221–223
glycogen synthase kinase 3 (GSK-3) 297
glycosylphosphatidylinositol (GPI)-linked proteins
apical sorting of 317
potocytosis and 69–71
glycosaminoglycan, constitutive release of 290
glycosphingolipids, mechanical stress and 304
Golgi complex
bidirectional membrane traffic between ER and 81–87, 168
brefeldin A and 51, 84, 85–86, 87, 110, 185
cis Golgi network 82–84, 85, 87, 426
constitutive secretion 290–292
DPAP A 4
dynein in localization of 7
ilmaquinone and 295
immunofluorescence microscopy of 216, 217, 218–219
intermediate compartment and 82–84, 85, 86, 87, 168, 216
KEX2 mislocalization 330, 334
maturation model of 83–84
membrane fusion 100, 169
membrane traffic default pathway in yeast 4, 427, 430–431
mitotic kinase inhibition of intra-Golgi transport 185
prolamin export to 441
protein retention in 418
TGN proteins 426–431
rab proteins and 52
rab8 and post-Golgi transport vesicles 418
SEC21 and 79
SED5 and 51
stereological analysis of 356, 357
trans Golgi network 84, 229, 290, 317, 330, 331, 418
dynamic retention of TGN proteins in yeast 426–431
legume storage proteins 438
TGN38/41 protein 252–255, 331, 428, 431
tubulation 110
vesicular transport model of 84
Gordon phenomenon 107
GPIb/IX 116
GP-2 protein, TGF-β receptor homology to 16
gpa1 gene 63–64
gravity, plant cell response to 414
GRB2 protein 12–13, 80, 228
growth factor(s)
neurotrophins 262–267
oligodendrocytes and 193, 194–195, 196
profilin and 383–384
receptors 262
SH2/SH3 domains and 8–9, 12–13
TGF-β receptors 15–19
release from wounded cells 304–306
tumour suppressors and genes for 32
see also individual growth factors
GTP-binding proteins *see also* G proteins
bacterial septation and 4
brefeldin A and 51, 85–86
coated-vesicle formation and 146, 147–148
ER-to-Golgi transport and 81, 82, 85–86
rab proteins 52
exocytosis and 26–27
membrane fusion and 100
Mx proteins: GTPases with antiviral activity 269–270, 271
neuronal membrane traffic and 169
rho control of cytoskeleton assembly, effect of chimeric toxin DC3B on 228
SH3 domains and 11–12
TGN38/41 protein and 252, 253–255
tubulin and 4
tumour suppressors and 39–42
guanylate kinase 41–42
gut, cell wounding in 302
gyrase, DNA 24

H

H_2O_2, peroxisomal 89, 92
HA2 adaptors 316
haemagglutinin (HA) 99, 100
haemolysin A, export of 421–422
haemopoiesis

TGF-β and 15
tumour suppressors and 32–33, 34, 48
HCO^-_3/CO_2 buffers 76–77
HEPES buffer 76–77
heterogeneous nuclear ribonucleoprotein (hnRNP) 151–155, 203, 445, 446
hexokinase
evolution of 58–59
structural similarities to actin and Hsc70 53–59
high-affinity NGF receptor (HNGFR) 263
hisactophilin
structure and function of 7
histone(s)
mRNA 180
microtubule stabilization by histone H1 51
HIV
gp120/41 99
mRNA 182
nuclear RNA concentrations 347
hly operon 421–422
HML locus 133
HMR locus 133
hormones
hormone-binding domains (HBDs) of steroid receptors 278–280
potocytosis and 70, 71
prohormone convertases 169, 170
see also insulin; prolactin
Hsc70 protein(s) 372, 375
evolution of 58–59
nucleolar RNAs and hsc70 transcripts 203
structural similarities to actin and hexokinase 53–59
HSP60 protein 137
HSP70 (hsp70) protein(s) 335–336, 338
chloroplast protein transport and 188
mitochondrial 135–136
nuclear protein accumulation and 328
RNases and 109
HSP90 protein
fusion proteins with steroid-binding domains 279–280
nuclear protein accumulation 328
hydroxyproline-rich proteins 416

I

ilmaquinone 295
immunofluorescence microscopy 214–219
immunoglobulin gene superfamily, tumourigenesis and 38
influenza virus
membrane fusion and 99, 100
Mx proteins and 268–269
α-inhibin 34
inositol phosphoglycan, potocytosis and 71
inositol trisphosphate
deflagellation-induced signal transduction and 157
nuclear envelope reconstitution and 334
profilin and 383–384
yeast 185
insulin
oligodendrocytes and 195
precursor 169
insulin-like growth factors (IGFs)
lysosomal hydrolases and IGF-2 (IGF-II) receptor 331
oligodendrocytes and IGF-1 194–195
Wilms' tumour and IGF-2 32
integrins
cell motility and 367, 368, 387, 389–390, 391, 395–396
focal adhesion kinase and 258–261
as mechanoreceptors 257
neural crest cell migration and 395–396
plant cytoskeleton–cell-wall continuum and 413–414, 415
tumourigenesis and 36–37
interferons (IFNs)
IFN-γ receptor homologue of myxoma virus 80
ISGF3 transcription factor 10, 78
Mx proteins and 268
tyrosine kinase and 10, 78
interleukin 1, secretion of 423–424
interleukin 6 gene, tumour suppressors and 32
intermediate filaments, cell motility and 379
ISA annexin 224, 225
ISGF3 (interferon-stimulated growth factor 3)
ISGF3γ domains 78
SH2 domains in ISGF3α 10
ISP6 gene 135
ISP45 protein 135

K

KAR2 protein 338
KAR3 protein (Kar3p) 435, 436
keratocyte locomotion 369, 377, 378
KEX1 protein (Kex1p) 427, 428
KEX2 (Kex2p) protease 330, 334, 427–429
kinesins
CENP-E protein 5, 435
centrosomal 126
flagellar motor proteins 160
MKLP-1 protein (CHO1 antigen) 5, 435, 436
spindle pole separation and 432–436
kinetochore
CBF2/NDC10 gene and 257
flagellar tip and 157
KIP1 protein (Kip1p) 433–434, 435, 436
KKXX retrieval system 229
KLPA protein (KlpAp) 435, 436
Knotted-1 gene 313
K-rev1 (*rap1*) gene 31, 40–41
KSS1 gene 64, 65

L

L5 ribosomal protein 95, 96
LAM1 gene 334
lamin B receptor 149
lamin C 212
lamin disassembly 299
laminin, neural crest cell migration and 395, 396
lectin RNases 107, 108, 109
leukocytes *see* neutrophils
LHCP protein 188–189
licensing factor for DNA replication 420
lipids
of caveolae 229
cell motility and 366
mechanical stress and 304
membrane fusion and 100
myelin 191, 195
see also phospholipids
lipocortin 99
Listeria
cytoskeleton assembly, effects of chimeric toxin DC3B on 228
motility 383
low-affinity NGF receptor (LNGFR) 262, 263–264, 265
low-density lipoprotein (LDL) receptor 145, 147, 177–178, 317
lucifer yellow (LY) and yeast endocytosis 273, 274, 275
lysosome, autophagy and 5

M

M4 receptor 150
macrophage capping protein 387
mam2 gene 63
mannose-6-phosphate, lysosomal hydrolases and 317, 331
α-mannosidase
vacuolar targeting of 7
MAP (mitogen-activated protein) kinase(s)
activation of 287, 288, 289, 333
substrate specificities of 297
yeast pheromones and 65, 256, 333
MAP kinase kinase 333
map1 gene 62
MAP1 protein
at centrosome 126
MAP1B in oligodendrocytes 196
map3 gene 63
MARCKS protein 196, 387

MAS1/MIF1 and MAS2/MIF2 136
mastigonemes 158
mat1 locus 62, 63, 64–65
*MAT*α1 mRNA 180
MBO2 gene 419
MCB motif 75
MCC gene 31
mechanical stress
actin meshwork and 369
cellular and molecular adaptations to cell wounding 302–307
integrins and 257
mei3 gene 62
meiosis
in *Schizosaccharomyces pombe* 60–61, 62, 63, 65
synaptonemal complex protein ZIP1 149
telomere and 130, 133
topoisomerase II mutants and 294
membrane(s)
annexins and 99, 147, 178, 179, 224–226
bacterial, role in DNA replication and chromosome partition of 20–25
brefeldin A and 51, 84, 85–86, 87, 110, 185
cell motility and 366
coated-vesicle formation 52, 145–148, 177–179, 316, 330–332
flagellar 158, 160
fusion 99–101, 169, 179, 184, 226, 256
AP-2 induced vesicle aggregation 52
cellubrevin 295
flickering 256
nuclear envelope assembly reconstitution, calcium and 334
G-protein interactions with 231
immunofluorescence microscopy of 214–219
mechanical stress and 302–307
mitochondrial 135–137
myelin 191–192, 195–196
nuclear, telomeres and 131–132, 133
peroxisomal 91–92, 93
plant cytoskeleton–cell-wall continuum 413–417
plasmodesmata 308–314
protein insertion into 72–74
protein translocation across membranes: common themes in divergent organisms 335–339
rab proteins and 52, 318, 418
RNases and 108–109
skeleton 113–117
stereological analysis of 356
wounding 302–307
see also endocytosis; exocytosis; membrane proteins; secretory pathway signal transduction *and individual organelles*
membrane proteins
chloroplast 4, 187–189
C-terminal anchor 72–74
default pathway in yeast 4, 427, 430–431
ER-to-Golgi transport and 82–83, 84, 85–87
flagellar 158
Golgi complex, retention of 418, 426–431
insertion of 72–74, 137
KEX2 mislocalization 330, 334
membrane skeleton and 113–114, 115, 116, 117
mitochondrial 137
myelin 191–192, 193, 195–196
peroxisomal 91, 92, 93
plasmodesmal 310
potocytosis and 69–71
sec-dependent and *sec*-independent assembly of *E. coli* inner membrane proteins 150
see also individual proteins
membrane skeleton 113–117
methanol oxidase 92
5-methyltetrahydrofolate, receptor-mediated transport of 69, 70
Mfd (TRCF) 229
mfm1 and *mfm2* genes 62–63
MGM1 gene product 270, 429
MHC class I molecules: in ER 85, 87
MHC class II molecules, antigen loading onto 317
microtubule(s)
basal-body-associated macromolecules 220–223
cell motility and 377–378
centrosome and 118–126, 377, 378–379
crossbridges 79
cyclin-dependent kinases and 298
dynein and Golgi complex localization 7
dynein heavy chain isoforms and axonemal motility 398–402
ER-to-Golgi transport and 83–84, 85, 86, 87
flagellar regeneration in *Chlamydomonas* 156–160
ilmaquinone and 295
nucleation of 124–126, 220–221, 298
oligodendrocyte 191, 196
plasmodesmata and 308
sea urchin microtubules, stabilization by histone H1 of 51
spectrin and 116
see also axoneme; spindle
microtubule-associated proteins (MAPs)
cyclin-dependent kinases and 298
histone H1 stabilization of sea urchin flagellar microtubules 51
projection domains of MAP2 and tau determine spacings between neuron microtubules 79
microtubule-organizing granules 125–126
minCDE system 24
MIP (mitochondrial intermediate peptidase) 136
mipA gene 124
mitochondrion
basal body and 223
biogenesis 137
cytochrome *c* oxidase complex assembly 50
proteins 135–137
C-terminal anchored membrane proteins 72, 73
targeting machinery 4
mitogillin 106
mitosis
assembly of centres for DNA replication 50
cdc2 protein and 287–289, 296, 298–299
centrosome and 118, 121, 123–125, 126
coiled bodies and 201–202
cyclin autoregulation in yeast 419
dynein and Golgi complex localization 7
hnRNP proteins and 153
intra-Golgi transport inhibition by mitotic kinase 185
nucleolus and 236, 239
spindle pole separation 432–436
spindle-associated antigens 5
telomere and 130–131
TGF-βs and 14
topoisomerase II mutants and 294
MKLP-1 protein 5, 435, 436
MOB2 protein 22
MOM19 protein 135
MOM72 protein 135
motility *see* cell motility
MPI1 and MPI2 proteins 135
MPM-2 126
MPP (matrix processing peptidase): α-MPP and β-MPP 136
MreB protein 58
mRNA
degradation and translation, association between 180–183
flagellar protein 156, 401
myelin-specific 196
nuclear RNA tracks 346–352
nucleocytoplasmic export of 154–155, 181–182, 350

ribonucleoproteins and 95, 96–98, 154–155
seed storage protein 438
mRNA-binding proteins 152, 182
mRNP3 and mRNP4 proteins 96–98
mukA gene 24
mukB gene 23
multivesicular bodies (MVBs) of R7 cells, boss internalization into 104, 105
muscarinic receptors, G proteins and 111, 231, 232, 235
muscle (cells)
differentiation of
bFGF and 306
pRB and 211, 213
profilin and 384
skeletal
contraction of 364–365
Duchenne muscular dystrophy 115, 303–304
mechanical stress and 302, 303–304, 306
transfection *in vivo* 306
Mx proteins 268–272, 429
myc gene
E2F-binding sites in 44
TGF-β and 14, 18
myelin 191–192
biogenesis of 195–196
myelin basic protein (MBP) 191, 192, 193, 195, 196
myelin-associated glycoprotein (MAG) 191, 192
myelin/oligodendrocyte glycoprotein (MOG) 191
MyoD, pRB and 211, 212, 213
myosin I, cell motility and 367, 374, 375–376
myosin II
cell motility and 366, 387
phosphorylation of 298
myotube membrane skeleton 114–115, 117
myxoma virus, encoding of a homologue of IFN-α receptor by 80

N

N1 protein, accumulation of 326
N-acetyl-Asn-Tyr-Thr-Cys-NH_2, redox state of 6
NADH-cytochrome b_5 reductase, membrane integration of 74
nck gene product, SH2/SH3 domains of 12, 184
NDC10 gene 257
necrosis 141
nerve growth factor (NGF) 262
receptors 262–267
neural crest cell migration 392–396
neurofibromin: as tumour suppressor 39–40
neurofilament proteins, phosphorylation of 299
neuromodulin (GAP-43) 196
neurons
membrane skeleton at node of Ranvier 116
membrane traffic in 169, 418
microtubule crossbridges in 79
neurofilament proteins, phosphorylation of 299
neurotrophin receptors 262–267
oligodendrocytes and 191, 193
plasmalogens and 90
R7 cell development in *Drosophila* compound eye 103–105, 228
rab8 expression in 418
synaptotagmin in exocytosis 110
neuropeptides, focal adhesion kinase and 261
neurotensin gene transcripts, localization of 347, 350
neurotrophins 262–267
neutrophil(s)
motility of 367, 377
Ca^{2+} regulation of 386–391
oxidative burst, SH3 domains and 12
NF1 gene 31, 39–40
NF1 transcription factor 164, 165, 166
NF3 transcription factor 164, 165
NK-κB transcription factor 150
Nicotiana alata self-incompatibility 106, 108, 340–342, 344
nm23 gene 31, 41
nodes of Ranvier, membrane skeleton at 116
nopp140 protein 239, 328
NSF (NEM-sensitive factor) 81
analogue of 100
PAS1 protein and 91, 93
SNAP receptors and 184, 256
yeast homologue of 275–276
NSP1 protein 78
NSP116 gene 78
NTP hydrolysis, chloroplast protein transport and 187
nuclear envelope
Lamin B receptor 149
mitotic breakdown 298–299
reconstitution of assembly 334
scanning of 79
nuclear localization signals (NLSs)
hnRNP proteins 153, 154
nuclear protein accumulation and 325, 326, 327, 328
nuclear pore complex
Balbiani ring RNP particle and 444–445
cryoelectron microscopy of 294
high-resolution scanning EM of 79, 206
hnRNP proteins and 152, 154
mRNA translation/degradation and 182
nuclear protein accumulation by facilitated transport and intranuclear binding 325–328
yeast nuclear pore proteins 78
nuclear–mitotic-apparatus protein 125
nucleoid positioning 23–24
nucleolin 239
nucleolus 236–241
assembly of 239–241
coiled body and 199–200, 203
protein accumulation in 327
structure of 236–239
nucleoplasmin (Np) 325, 326, 327–328
nucleoside diphosphate (NDP) kinase 41–42
nucleosome
Balbiani ring chromatin and 443
DNA replication origins and 165, 166
reorganization in absence of DNA replication 76
telomeres and 129
5'-nucleotidase, adenosine transport and 70
nucleus
apoptosis and 141
Balbiani ring RNP particle 443–446
centrosome position relative to, cell motility and 378–379
coiled body 198–203, 347
cryoelectron microscopy 1
DNA concentration in 1
hnRNP proteins and 151–155
liquid concept of chromatin 2–3
Mx proteins in 269
nuclear RNA tracks 346–352
nucleocytoplasmic transport 154–155, 181–182, 239, 325–328, 350, 444–445
dorsal gene product 150
see also nuclear envelope; nuclear pore complex
nucleolus 199–200, 203, 236–241
peroxisome biogenesis and 91
protein accumulation by facilitated transport and intranuclear binding 325–328
telomeres and 128–133
transcript domains 347, 350–351, 352
twisting DNA 1–3
nucleus–basal body connector 124
NUP proteins 78

O

oligodendrocyte(s) 191–197
development of 192–195

myelin biogenesis by 195–196
oligodendrocyte-myelin glycoprotein (OMgp) 191–192
oncogenes and products
location near telomeres 133
oncogenic tyrosine kinases 10
tumour suppressors and 33
see also individual genes
onconase 107, 108
origins of replication 161–163
bacterial membranes and 21–22
chromosome partition and 23
subnuclear localization of replication protein A 50
transcription factors and 161–166, 333
oxygen-evolving complex proteins 189

P

p21^{rac}, SH3 domains and 11–12
p21^{ras} *see* Ras superfamily
p29 in ciliary beat control 411–412
p30 (onconase) 107, 108
p34^{cdc2} 296
cellular substrates of 297, 298–299
centrosome and 126, 298
cyclin binding and Thr 161 phosphorylation 287–289
inhibition of intra-Golgi transport 185
novel cyclin-like protein and 112
nucleoplasmin phosphorylation by 328
see also cyclin-dependent kinases
p41^{FRNK} protein 258, 260
p47-phox/p67-phox, SH3 domains of 12
P48 (Ffh) protein 6
p53 oncogene/protein 31, 32, 34, 38, 46–49
apoptosis and 34, 47
inactivation of 33
TGF-β and 14
as transcription factor 47
p53, p58 and p63 as compartment markers 82–83, 85, 216
p62, TGN38/41 protein and 253–255
p65 (synaptotagmin) 110, 169
p80 coilin 198–199, 201, 202
phosphorylation of 202
p107, E2F association with 44, 45, 75
p140 of synapse 331
p190, SH3 domain and 11
PAI gene, TGF-β and 18
pancreatic RNase A 108, 109
Papaver rhoeas self-incompatibility 340, 342–344
papillomavirus DNA replication 162, 164, 333
par genes 22, 24
Paramecium ciliary beat frequency 409–412
paramyxovirus F protein 99
PAS proteins 91–92, 93
pat1 gene 61, 62
paxillin 258, 260
PC (prohormone convertase) family 169, 170
PCNA (proliferating cell nuclear antigen), cyclin-dependent kinases and 300
pelle gene 150
PEP4 gene 428
PEP12 protein 51
perforin 143
pericentriolar material 124, 125–126
peroxisome(s)
biogenesis 89–93
PMP70 protein 424
peroxisome assembly factor-1 (PAF-1) 91, 93
pertussis toxin, G proteins and 232
PGK1 mRNA 181, 182
phagocytosis 316
pheromones, yeast 60–65, 231–232, 256, 333
a-factor secretion 422–423, 424
α-factor internalization in mutants 273–276
phloem
plasmodesmata of 310, 311–312, 313, 314
viruses and 313
PHO5 gene 78
PHO85 gene 299
phosducin 232–233
phosphatidylinositol 4,5-bisphosphate, cell motility and 368, 372, 381, 383–384, 387
phosphatidylinositol 3-kinase (PI 3–kinase)
SH2/SH3 domains of 8, 9, 10, 11, 184
phospholipase C (PLC)
PLC1 gene, yeast 185
PLCβ isoforms, G proteins and 232, 235, 384
PLCγ SH2/SH3 domains 8, 9–10, 184
PLCγ1 and profilin 383–384, 387
phospholipids, membrane
C-terminal-anchored membrane proteins and 73, 74
DnaA activity and 20–21, 22
G-protein interactions with 231
membrane fusion and 100
myelin 191
peroxisomes and 89, 90
phototaxis in *Chlamydomonas* 403–408
Physarum
DNA replication 161–162, 166
profilin 166, 385
PIK-A49 (phosphatidylinositol kinase activator) 416
plant(s)
cytoskeleton–cell-wall continuum 413–417
plasmodesmata 308–314
profilins 381
RNases 106, 108, 341–342, 343, 344
salicylic acid in 419
seed storage proteins 437–442
self-incompatibility in 106, 108, 340–344
telomeres 130–131, 132
viruses 312–314
see also chloroplast
plasmalogens, peroxisomes and 89, 90
plasmodesmata 308–314
plastids *see* chloroplast
L-plastin 387
plastocyanin 189
platelet(s)
focal adhesion kinase and 259
membrane skeleton of 114, 115–116
platelet-derived growth factor (PDGF)
oligodendrocytes and 193, 194, 196
receptor
SH2 domain and 8–9
TGF-β and 15
release from wounded cells of 304
PLC1 gene 185
PMP70 protein 424
pollen
receptor 343
'response' genes 344
self-incompatibility and 106, 108, 340–344
tube, growth of 414
poly-L-proline, profilin binding of 381, 384
polyoma virus
DNA replication 162, 163, 165, 166, 333
middle T antigen, C-terminal anchor of 73, 74
polyphosphoinositides, profilin binding of 368, 372, 381, 383–384, 387
polytene chromosomes
Balbiani ring RNP particle 443–446
nuclear RNA tracks 351–352
ponticulin 369, 371–372
POPA 125
potassium (K^+) channel, G-protein activation of 231, 235
potocytosis 69–71, 250
poxviruses, cellular immune response and 80
pp59^{fyn} 260–261

pp60^{src} 260
pp125^{FAK} 258–261
pRB 32
  cell growth/differentiation and 33–34, 43–44, 212–213, 299–300
  E2F and 44–45, 75, 211, 212, 213
  inactivation of 33
  TGF-β and 14, 212–213
  transcription and 44–45, 211–213
  viral oncoproteins and 43, 211, 212
prBt1 protein, targeting of 4
prealbumin (transthyretin) 70
profilin(s) 381–385
  actin binding by 368, 369, 372, 373, 381–385, 387
  expression of 385
  isoforms of 381, 385
  other interactions of 383–385, 387
  Physarum 166, 385
  structure of 381
prohibitin gene 31
prohormone processing 169–170
proinsulin 169
prolactin
  constitutive release of 291
  preprolactin translocation 336–337
prolamins 437–442
promoters
  of IFN-α-inducible genes 78
  nucleosome reorganization and 78
  pRB and 212–213
  ribonucleoprotein storage particles and 94, 97–98
  RNA polymerase interaction with 2
protein disulphide isomerase, prolamin assembly and 441–442
protein kinase C (PKC)
  CD4 endocytosis and 317
  constitutive secretion and 290, 291
  MARCKS phosphorylation by 387
protein phosphatase 2A (PP-2A)
  phosducin and 233
  tyrosine phosphorylation of 6
protein phosphatase 2B (calcineurin) 390, 391
protein tyrosine phosphatase 1B, C-terminal anchor of 74
proteolipid protein (PLP) 191, 192, 193, 195–196
prSS protein 187, 188
prune gene 41
PTPγ gene 31, 32
PU.1 protein 211, 212
PVN1 protein 416

R
R7 neuron development in *Drosophila* compound eye 103–105, 228
rab proteins
  coated-vesicle formation and 147–148, 420
  endocytosis and 317–318
  ER–Golgi transport and 52, 81, 82, 418, 420
  neuronal membrane traffic and 169, 418
  rab8 and post-Golgi transport vesicles 418
  TGN38/41 protein and 252, 253–255
  yeast homologue of rab7 276
radial spokes 156, 157–158, 159, 400, 409
Raf–Ras interactions 333
ral2 gene 64
Ranvier, nodes of, membrane skeleton at 116
rap1 gene 31, 40–41
RAP1 protein, telomere and 129–130, 131–132
Ras superfamily
  activation pathway 228
  Grb2 protein and 80, 228
  Raf and 333
  SH2/SH3 domains and 12–13, 228
  Shc proteins and 80
  tumour suppressors and 39–42
  yeast pheromones and 64, 65, 333
RasGAP protein
  SH2 domain of 8, 9
  as tumour suppressor 39, 40, 41
RB control element (RCE) 213
RB-1 gene 31, 32, 33–34
  product *see* pRB
  TGF-β and 14
red-clover necrotic mosaic virus 313
redox state of endoplasmic reticulum 6
Refsum's disease, infantile 90
replication factor (protein) A
  sub-nuclear localization of 50
  transcription factors and 333
restrictocin 106
retinal 403–405
rho control of cytoskeleton assembly, effect of chimeric toxin DC3B on 228
rhodopsin(s) 232, 233
  Chlamydomonas phototaxis and 403–406
  yeast mating and 63–64
rhodopsin kinase 232
rhoGAP
  SH3 domain and 11, 12
ribonucleoprotein (RNP) particles
  Balbiani ring RNP particle 443–446
  cytoplasmic hnRNP–mRNA complex 155
  heterogeneous nuclear (hnRNP) 151–155, 203, 445, 446
  small nuclear (snRNPs) 151, 154, 155, 237
    coiled bodies and 200–201, 202–203, 347
    nuclear RNA tracks and 347, 351, 352
  in *Xenopus laevis* oocytes 94–8
  see also signal-recognition particle
ribosome(s)
  biogenesis of 236–239
  mammalian SEC61 protein and 50
  mRNA degradation and 180–181, 182, 183
  ribonucleoprotein storage particles and 94, 95–96, 97
  α-sarcin and 109
  translocation and 293, 338
RIF1 130
RISBASEs: RNases with special biological actions 106–109
RNA
  heterogeneous nuclear (hnRNAs) 151–155
  microtubule nucleation and 220–221
  nuclear RNA tracks 346–352
  plant virus 312–313
  pollen 341–342, 344
  in signal-recognition particles 6, 335
  small nuclear (snRNAs) 200, 202, 237, 239
  small nucleolar (snoRNA) 200, 203
  splicing of 155, 200, 202–203, 347, 349–350, 352
  in *Xenopus* ribonucleoprotein storage particles 94–98
  see also mRNA; ribonucleoprotein particles; rRNA
RNA polymerase(s)
  DNA rotation and 1–3
  interaction with promoter of 2
  in nucleolus 238, 239, 240
  ribonucleoprotein storage particles and 94, 95
    hnRNP particles 151, 153–154
  viral, Mx proteins and 269
RNA synthesis *see* transcription
RNases
  microtubule nucleation and 220–221
  mRNA degradation and 180–181, 182
  RISBASEs 106–109

self-incompatibility in plants and 106, 108, 341–342, 343, 344
Rous sarcoma virus (RSV) mRNA 181, 182
rRNA (ribosomal RNA)
coiled body and 199
genes 236–241
pollen 341–342
ribonucleoproteins and 94–95, 98, 154, 237
RSP3 protein 157–158, 159
RTX proteins 421–422
Rubisco chimera: identification of contact-site intermediate in chloroplasts 111

S

S6 ribosomal protein 32–33
SAC6 gene 274–275
Saccharomyces cerevisiae see yeast
salicylic acid in plants 419
SAR1 protein 81
α-sarcin 106, 108, 109
SBF transcription factor 75
SC-35 antigen, nuclear RNA tracks and 347, 351, 352
scanning electron microscopy, high-resolution 205–208
of nuclear envelope 79
SCB motif 75
Schizosaccharomyces pombe see yeast
SCIP/tst-1 transcription factor 193
SCO1 protein 136
SEC proteins 4, 81, 336, 337–338, 339
annexins and 179
assembly of *E. coli* inner membrane proteins and 150
endocytosis and 275–276
SEC18 protein, PAS1 similarity 91, 93
SEC21 protein 79
SEC61 protein and SecY 337–338
mammalian homologue 50, 337, 338
secretory pathway
constitutive secretion 290–292
membrane traffic default pathway in yeast 4
redox state of endoplasmic reticulum 6
TGN38/41 protein and 252–255
see also endoplasmic reticulum; Golgi complex; *trans* Golgi network; translocation of peptides/proteins across membranes
SED5: a novel yeast membrane protein 51
seed storage particles, assembly and transport of 437–442
self-incompatibility in plants 106, 108, 340–344
Sem-5 protein 12
mammalian homologue GRB2 12–13, 80, 228
Sendai virus 99–100, 101
septation, bacterial
FtsA protein and 58
GTP binding in 4
serine proteases, apoptosis and 143
serine/threonine kinase(s)
focal adhesion kinase and 260
pelle gene product 150
Ras–Raf interactions 333
TGF-β type II receptor 16–19
tyrosine phosphorylation of phosphatase PP-2A 6
serotonin release, flickering fusion and 256
sev (sevenless) protein: sev–boss interactions in R7 neuron development 103–105
severin 372, 376
S-gene/S-proteins 106, 108, 340–344
SH2 domains 8–11, 12–13
binding specificities of 184
proteins containing 8, 10
Sem-5/Grb2 12–13, 80, 228
structure of 10–11
SH3 domains 8, 11–13
binding proteins 150
proteins containing 8, 11
Sem-5/Grb2 12–13, 80, 228
Shc proteins, association with Grb2 protein of 80
shibire gene/product 104, 148, 271, 272, 294
sieve elements, plasmodesmata and 311–312, 313
signal transduction
cell adhesion molecules and 36, 38
cell motility and 364, 368, 371, 383–384, 387, 390
ciliary beat frequency and 409–412
coatomer binding and 86–87
constitutive secretion and 290–292
deflagellation-induced 156–157
endocytosis and 274
fluorescence resonance energy transfer in study of 242–245
focal adhesion kinase and 258–261
interferons and 78
neuropeptides and 261
phosphatase PP-2A and 6
phospholipase C in yeast and 185
phototaxis in *Chlamydomonas* 403–408
potocytosis and 71
profilin and 383–384
Ras activation by tyrosine kinases 80, 228
Ras–Raf interactions 333
self-incompatibility in plants 340, 343–344
SH2/SH3 domains and 8–13
TGF-β receptors and 15–19, 334
Trk neurotrophin receptors and 262–263, 265–266
tumour suppressors and 32, 39–42
yeast mating and 60–65, 231–232, 256, 273–275, 333
see also G proteins
signal-recognition particle (SRP) 335
bacterial 6
C-terminal-anchored membrane proteins and 72–73, 74
receptor 74
simian immunodeficiency virus 100
SIR proteins, telomere and 132, 133
62/64 kDa doublet 124
SLY2 protein 73
small nuclear ribonucleoprotein particles (snRNPs) 151, 154, 155
in coiled bodies 200–201, 202–203, 347
and nuclear RNA tracks 347, 351, 352
in nucleolus 237
SNAP receptors 184, 256
sodium, membrane skeleton and 116
somatostatin receptors, G proteins and 111, 235
Sos protein 228
SP1 protein 213
spectrin family of proteins 113–117, 303
sperm
basal-body-associated macromolecules 220–221, 222
dynein heavy chain isoforms 399–400
profilins and 381, 383
RNase and 107, 108, 220–221
SP-H antigen 125
spindle
CENP-E protein 5, 435
mitotic spindle pole separation 432–436
MKLP-1 protein (CHO1 antigen) 5, 435, 436
yeast 123, 124, 126, 433–434, 435, 436
spk1 gene 65
splicing
nuclear RNA tracks and 347, 349–350, 352
ribonucleoprotein particles and 155, 200, 202–203
Balbiani ring RNP structure

and 446
SPN antigen 125
Src family of tyrosine kinases
cadherins and 36
focal adhesion kinase and 260–261
SH2 domains of 10, 11, 184
S-RNases 106, 108, 341–342
SSA protein 335
StbA protein 58
STE genes/products 230, 427
a-factor secretion and 422–423, 424
mating and 61, 62, 63, 64–65, 231–232, 273, 274
stereology 354–358
steroid receptors, hormone-binding domains of 278–280
stress, mechanical 257, 302–307, 369
subtilisin-related endoproteases 169–170
SV40 T antigen
DNA replication and 162, 163, 164–165, 166
nuclear accumulation of 325, 326, 328
p53 inactivation and 46
tumours and 33, 34
SWI4 protein 75–76, 419
SWI6 protein 75
sxa genes 62, 63
synaptobrevins
BOS1 protein 73, 256
C-terminal anchor 73, 74
synaptonemal complex protein ZIP1 149
synaptotagmin 110, 169
synexin 99, 224, 226
syntaxin 51, 169, 256

T

T7 gene product, myxoma virus 80
talin 258, 260
TAP1 and TAP2 424
TBP transcription factor 212
T-cell hybridoma, apoptosis and 141, 142–143
telomeres 128–133
tenascin 394, 395, 396
tensegrity model of cytoskeleton 257
tensin 258, 260
TFIIB transcription factor 212
TFIIH transcription factor: 89 kDa subunit is ERCC-3 helicase 229
TFIIIA 94–95, 96, 98
TFIIIC 94, 95
TGN38/41 protein 252–255, 331
thiolase, peroxisomal 89, 91
thioredoxin, secretion of 423–424
thylakoid membrane 186, 189–190
thymocytes, apoptosis in 141–142
thymosin β4 372, 383
thyroxine, carrier protein for 70
tobacco mosaic virus (TMV)
plasmodesmata and 312–313, 314
salicylic acid and 419
TolC protein 24, 421–422
Toll–dorsal pathway, phosphorylation in 150
topoisomerase I
DNA rotation and 2
in nucleolus 238, 239, 240
topoisomerase II
mutants, meiosis in 294
TopoIV 24
toxins
ABC-transporters for 421–422
effect of chimeric toxin DC3B on rho 228
TRAM protein 336–337, 338
transcription
apoptosis and 141–144
Balbiani ring RNP particle 443–446
cyclin autoregulation in yeast 419
deflagellation-induced 156–157
DNA repair coupled to 229
DNA replication order and 161, 163
DNA rotation during 1–3
nuclear RNA tracks and 346–352
ribonucleoproteins and 94–95, 98
hnRNPs 151–152, 153–154
snRNPs 200, 202, 237
rRNA genes 236–241
splicing following 155, 200, 202–203, 347, 349–350, 352, 446
telomeres and 133
tumour suppressors and 32, 44–45, 47
pRB 44–45, 211–213
viral, Mx proteins and 268, 269
transcription factor(s)
cyclin-dependent kinases and 298, 419
ERCC-3 helicase as a subunit of TFIIH 229
ISUF3 10, 78
nucleolar 238, 239
oligodendrocyte development and 193
origins of replication and 161–166, 333
p53 as 47
pRB and 44–45, 211–213, 299
ribonucleoprotein storage particles and 94–95, 97–98
SH2 domains in 10
structural similarity between mammalian and yeast 75–76
Toll–dorsal pathway 150
yeast pheromones and 61, 62
transducin 405
transferrin, receptor-mediated endocytosis of 145–146, 147, 316
transforming growth factor β (TGF-β) superfamily 14
betaglycan and 334
α-inhibin 34
multiple actions of 14–15
pRB and 14, 212–213
receptors for 15–19, 334
soluble proteins binding TGF-β 15
TGF-β_2 structure 14
transin/stromelysin
TGF-β and 14–15, 18
translation
apoptosis and 141–144
mRNA degradation and 180–183
ribonucleoprotein storage particles and 94, 95–97, 98
RNases and 106–107, 109
translocation
ABC-transporters of peptides/proteins across membranes 421–425
aqueous environment of 293, 339
chloroplast 4, 52, 111, 186–190
mitochondrial 135–136
peroxisomes and 89, 93
protein translocation across membranes: common themes in divergent organisms 335–339
SEC61, mammalian homologue of 50
Sec proteins and assembly of *E. coli* inner membrane proteins 150
see also signal-recognition particle
transport in oligodendrocytes 195–196
transthyretin 70
TRCF (transcription–repair coupling factor) 229
triosephosphate isomerase mRNA 182
triskelion 177, 178
Trks (neurotrophin receptors) 262–267
tRNA, ribonucleoprotein storage particles and 94, 95–96
tube gene product 150
tubulin(s)
flagellar regeneration in *Chlamydomonas* 156, 157, 159
γ-tubulin 123, 124
GTP binding by 4
mRNA 156, 180
polymerization 124
see also microtubules
tumour suppressor genes (TSGs) and products 31–35
cell adhesion molecules and 32, 36–39

Drosophila 31, 32–33, 34, 37–38, 41
GTP-binding protein activity and 39–42
patterns of inheritance of 31
signal transduction and 32, 39–42
see also individual genes and proteins
TW260/240 113
tyrosine kinases/tyrosine phosphorylation
cell adhesion and 32, 36, 260
cell motility and 260, 373
focal adhesion kinase 258–261
interferons and 10, 78
neurotrophin receptors 262–267
of phosphatase PP-2A 6
Ras activation and 228
Shc and Grb2 proteins and 80
sev–boss interactions in R7 neuron development 103–105
SH2 and SH3 domains 8–13
TGF-β receptor 17, 19

U

U2AF splicing factor 203, 347
UBC6 protein 74
UBF protein 212, 238, 239
ubiquitin conjugation, PAS2 protein and 91
UPF gene products 181, 182
URA1 and *URA3* mRNAs 181, 182
uracil-DNA glycosylase: novel cyclin-like protein 112
uromodulin, TGF-β receptor homology to 16
uvomorulin 116–117

V

vaccinia virus
membranes 168
profilin 381
vacuole(s)
buffer-induced vacuolization 76–77
plant, seed storage proteins in 437–438, 439
yeast
autophagy and 5
hydrolase targeting 330, 331
membrane traffic default pathway 4, 427, 430–431
prevacuolar endosome like compartment 293, 330–331, 429
vacuolar targeting directly from the cytoplasm 7
vascular system, mechanical stress and 303, 305
vasopressin 261
vesicular stomatitis virus
G protein 83
Mx proteins and 268–269
VFL1 gene 419
vimentin
cell motility and 379
p34^{cdc2} phosphorylation of 299
vinculin 258, 260
VIP21 protein 169, 229, 249
virus(es)
cellular immune response and 80
DNA replication, transcription factors and 161–166, 333
interferon synthesis and 78, 80
membrane and fusion 99–100, 101
movement proteins 312–314
Mx proteins and 268-272
nuclear RNA tracks 347, 348, 351, 352
plasmodesmata and 312–314
see also individual viruses
vitronectin
neutrophil motility on 389, 390, 391
plant cytoskeleton–cell-wall continuum and 413–414, 415, 416
VP16 163, 166
acidic activator domain of 333
GAL4-VP16 165, 333
VPS genes 428–429, 430, 431
VPS1 protein 334, 429, 430, 431
Mx proteins and 270, 271, 272, 429
v-Src protein, SH2 domain of 10

W

wir1 gene 415–416
WT1 gene 31, 32, 33

X

Xenopus laevis
DNA replication in oocytes, licensing factor for 420
Eg5 protein 126, 433, 434, 436
nuclear pore complex, cryoelectron microscopy of 294
nuclear protein accumulation in oocytes 327
nucleolar assembly *in vitro* 240
ribonucleoprotein storage particles in oocytes 94–98
Xist RNA 348

Y

YDJ1 protein 135, 335
yeast
a-factor secretion 422–423, 424
annexins 99
autophagy 5
brefeldin A sensitivity 185
coatomer proteins 79
cyclin autoregulation 419
cytochrome *c* oxidase complex assembly 50
DNA replication, transcription factors and 161–162, 163, 166
endocytosis 273–276, 330–332
in *end* mutants 110, 275
fibrillarin gene 199–200
G proteins *see STE* genes/products
mating, signal transduction during 60–65, 231–232, 256, 273–275, 333
membrane traffic default pathway 4, 427, 430–431
mitochondrial proteins 135, 136, 137
mRNA stability 180, 181, 182
nuclear pore proteins 78
peroxisome biogenesis 89, 91–92, 93
prevacuolar endosome-like compartment 293, 330–331, 429
profilins 381, 383, 384–385
protein translocation across membranes: common themes in divergent organisms 335–339
Ras–Raf interactions 333
SH3 domains 11, 12
spindle poles 123, 124, 125, 126, 433–434, 435, 436
telomeres 128, 129–130, 131–132, 133
transcription factors
pheromones and 61, 62
structural similarity between mammalian and 75–76
TGN membrane protein retention 426–431
vacuolar targeting 7
VPS1 protein 270, 271, 272, 334, 429, 430, 431
ZIP1 protein 149
see also SEC proteins
YPT7 gene 276

Z

Zellweger syndrome 90, 91
ZIP1 protein 149
ZmPK1 protein 17
Zp2/Zp3 receptors
TGF-β receptor homology to 16
zyxin 258

3BPI and 3BP2 proteins 150
3-D quantitation of ultrastructure 354–358
42p43 protein 96, 98
42p50 protein 95–96, 98

Book Review Index

Alt, F. W. and Vogel, H. J., *Molecular Mechanisms of Immunological Self-Recognition* 448

Bagshaw, C. R., *Muscle Contraction* (2nd edn) 281
Balkwill, F., *DNA is Here to Stay* 246
Bentz, J., *Viral Fusion Mechanisms* 359
Beynon, R. J., *Postgraduate Study in the Biological Sciences: A Researcher's Companion* 359
Bryce, C. F. A., *Microcomputers in Biochemistry: A Practical Approach* 27
Burgen, A. and Barnard, E. A., *Receptor Subunits and Complexes* 138
Butler, M. and Dawson, M., *Cell Culture Labfax* 171

Devor, E. J., *Molecular Applications in Biological Anthropology* 319
Doherty, F. J. and Mayer, R. J., *Intracellular Protein Degradation: in focus* 171

Epand, R. M. and Lester, D. S., *Protein Kinase C: Current Concepts and Future Perspectives* 448

Federoff, S. and Richardson, A., *Protocols for Neural Cell Culture* 171
Fleming, T., *Epithelial Organization and Development* 171

Givan, A. L., *Flow Cytometry: First Principles* 319
Goldstein, J. I., *Scanning Electron Microscopy and X-Ray Microanalysis* (2nd edn) 66
Goodsell, D. S., *The Machinery of Life* 359
Gwatkin, R. B. L., *Genes in Mammalian Reproduction* 281

Hausen, P. and Riebesell, M., *The Early Development of Xenopus laevis* 209
Herman, B. and Lemaster, J. J., *Optical Microscopy* 319
Hooper, N. M. and Turner, A. J., *Lipid Modification of Proteins: A Practical Approach* 138

Latchman, D. S., *Transcription Factors: A Practical Approach* 448

McDonald, J. A. and Mecham, R. P., *Receptors for Extracellular Matrix* 66
McKay, E. and Leigh, I., *Growth Factors: A Practical Approach* 448
Morgan, S. J. and Darling, D. C., *Animal Cell Culture* 448
Morowitz, H. J., *Beginnings of Cellular Life: Metabolism recapitulates Biogenesis* 319
Moss, S. E., *The Annexins* 138

O'Reilly, D. R., Miller, L. K. and Lucklow, V. A., *Baculovirus Expression Vectors : A Laboratory Manual* 171

Perutz, M., *Protein Structure – New Approaches to Disease and Therapy* 448
Ptashne, M., *A Genetic Switch* (2nd edn) 101
Putney, J. W., Jr, *Inositol Phosphates and Ca^{2+} Signalling* 27

Quinn, P. J. and Cherry, R. J., *Structural and Dynamic Properties of Lipids and Membranes* 281

Rawlins, D. J., *Light Microscopy* 27
Rickwood, D., *Preparative Centrifugation: A Practical Approach* 281
Rickwood, D. and Dealtry, G. B., *Cell Biology Labfax* 171
Rothman, J. R., *Reconstitution of Intracellular Transport* 359
Royce, P. M. and Steinmann, B., *Connective Tissue and Its Heritable Disorders: Molecular, Genetic and Medical Aspects* 359

Shotton, D., *Electronic Light Microscopy* 448
Stevenson, B. R., Gallin, W. J. and Paul, D. L., *Cell–Cell Interactions: A Practical Approach* 281

Tobin, A. K., *Plant Organelles, Compartmentation of Metabolism in Photosynthetic Cells* 246
Travers, A., *DNA–Protein Interactions* 319

Watson, J. V., *Flow Cytometry Data Analysis: Basic Concepts and Statistics* 319
White, B. A., *PCR Protocols* 448
Williams, J., Ceccarelli, A. and Spurr, N., *Genetic Engineering* 281

NEW
Annual indexes with every subscription

It is easy to stay informed

ELSEVIER TRENDS JOURNALS

Simply...

Phone: +44 865 743300
or (914) 333 2458
Fax: +44 865 743940
or (914) 333 2444
E-mail: A.FRICKER@ELSEVIER.CO.UK

We'll do the rest

Make sure you too are receiving the world's leading review journals every month. SUBSCRIBE TODAY

Subscribe

I would like to subscribe to _____

_____

12 monthly issues beginning _____ (enter any month in '94)

	USA/Can	UK/Row
Personal	☐ $110.00	☐ £69.00
Institutional	☐ $490.00	☐ £318.00
50% student discount	☐ $55.00	☐ £34.00

Please send proof of student status. Air-assisted delivery is fully inclusive

Payment

☐ Personal cheque/Eurocheque/money order payable to **Elsevier**

☐ **Credit card**

☐ Visa/B.card ☐ M.card/Access ☐ Am. Ex.

Card No _____

Expiry Date _____

VAT registration no†. _____

Total Payment inc.VAT (except UK)† _____

Sample copies

Please send a copy of _____

Address

Name _____

Address _____

_____

_____

Zip/Post Code _____

Country _____

Telephone _____

Facsimile _____

† **EC Customers outside the UK (1993 EC Directive)**
Non VAT registered customers must pay VAT. *Please add VAT (at your country's rate) to the price.* VAT registered customers must provide VAT registration no.
EC countries and VAT equivalents Belgium: BTW, Denmark: MOMS, France: TVA, Germany: MWST, Greece: FPA, Eire: VAT, Luxembourg: TAV, Spain: IVA, Netherlands: BTW, Italy; IVA, Portugal; IVA

Titles in the Trends series include:

- Immunology Today
- Parasitology Today
- Trends in Biochemical Sciences
- Trends in Biotechnology
- Trends in Cell Biology
- Trends in Ecology & Evolution
- Trends in Food Science & Technology
- Trends in Genetics
- Trends in Microbiology
- Trends in Neurosciences
- Trends in Pharmacological Sciences
- Trends in Polymer Science

ELSEVIER TRENDS JOURNALS

Return to: Elsevier Trends Journals, PO Box 800, Kidlington, Oxford, UK, OX5 1DX. **or**
Elsevier Trends Journals, Elsevier Science Inc., 660 White Plains Road, Tarrytown, New York, 10591 - 5153, USA.